

## CLAIMS

I claim:

1. A method for supporting and positioning a payload effecting simultaneous vibration isolation and large force and stroke position actuation comprising the steps of:
  - a) supporting the payload on a gas piston,
  - b) commanding gas pressure applied to the gas piston with a pneumatic servo-valve,
  - c) measuring the error in pressure resulting upon the gas piston,
  - d) applying a magnetic force in parallel to the resulting pressure in proportion to the measured pressure error.
2. The method of Claim 1 wherein the step a) of supporting the payload is further comprised of sizing a gas tank and a cylinder supporting the piston to a volume providing a gas-spring stiffness to yield a desired low vibration isolation frequency of the payload.
3. The method of Claim 1 wherein the step d) of applying a magnetic force in parallel is further comprised of applying a magnetic force to a coil attached to the piston.
4. The method of Claim 1 wherein the coil and piston are attached via a common uniaxial carriage.

5. The method of Claim 4 wherein the uniaxial carriage is supported on gas bearings and the gas piston is of gas bearing construction such that the carriage is completely supported laterally on a film of gas.

6. The method of Claim 5 wherein the gas bearings and gas piston are completely contained within a gas tight housing and bearing feed pressure is supplied by a pressure line to the gas tight housing and bearing escape gas is scavenged and drawn off with a gas scavenging line from the housing such that the carriage, bearings and housing effect a gas tight isolator-actuator unit suitable for vacuum environment usage.